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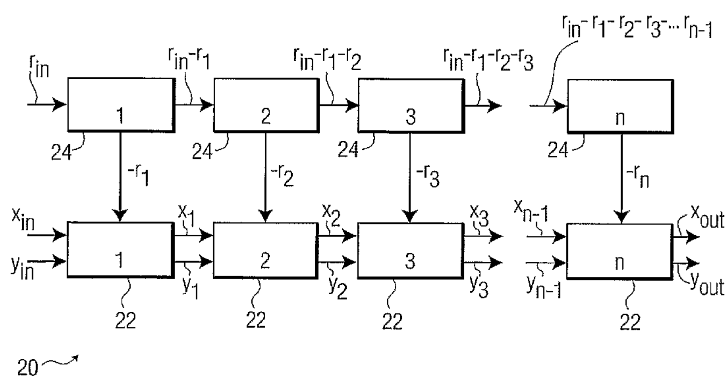
(54) Title: IMPLEMENTATION OF THE CORDIC ALGORITHM FOR COMPLEX PHASE ROTATION



(57) Abstract: An improved implementation of the CORDIC algorithm that considers the n highest-order active bits in each stage of the CORDIC implementation resulting in increases in the precision of the final result by 2^n. The rotational angle increment n-1 possible magnitudes that can be either positive or negative. The rotational angle increment is selected using the sign bit, along with the n-1 highest order active bits, of the rotation angle and an adjusted rotation angle is obtained by discarding the n highest-order active bits, and sign-extending the result using a negative sign when the lowest-order of these n bits equals the sign bit of present-stage rotation angle and a positive sign when they are different (this is equivalent to an exclusive NOR, or XNOR, operation on these two bits). Finally, the tangent is selected from 2^n possible values (2^{n-1} magnitudes, each with 2 signs), such that it corresponds to the present-stage rotation angle. The use of this method results in a CORDIC implementation for which each stage increases the precision of the final result by a factor of 2^n, by considering n bits of the present-stage rotation angle. As a result, the number of stages needed, relative to the traditional implementation, is reduced by a factor of n.

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— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations*

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